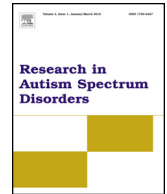




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## Computer-mediated communication in adults with high-functioning autism spectrum disorders and controls



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### ABSTRACT

It has been suggested that people with autism spectrum disorders (ASD) are attracted to computer-mediated communication (CMC). In this study, we compare CMC use in adults with high-functioning ASD ( $N = 113$ ) and a control group ( $N = 72$ ). We find that people with ASD spend more time on CMC than controls, are more positive about CMC, and report relatively high levels of online social life satisfaction. However, CMC use is negatively related to satisfaction with life for people with ASD. Our results indicate that the ASD subjects in this study use CMC at least as enthusiastically and successfully as controls but that there may also be negative sides to its use.

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## 1. Introduction

Recently, more and more attention is paid to the impact of computer-mediated communication (CMC) on people with autism spectrum disorders (ASD), but it is rarely directly compared to the impact it has on people without ASD. The popularity of autism-related websites and mailing lists suggests high online activity by people with ASD<sup>1</sup> (Davidson, 2008). However, people with ASD typically have communication deficits (American Psychiatric Association, 2013; Hengeveld, Van Londen, & Van der Gaag, 2008). The current paper addresses three questions about CMC use of people with ASD by comparing it to a control group. (1) Do people with ASD use CMC in the same way as controls? (2) What aspects of CMC are valued by people with ASD and controls? (3) How is CMC use related to different life outcomes (e.g., satisfaction with social life, loneliness) for people with ASD and controls?

### 1.1. Computer-mediated communication

Computer-mediated communication is relatively consistent, predictable, and uni-modal; most CMC is text-based, takes place in a structured environment, is frequently asynchronous (giving users more time to process the information) and has

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<sup>1</sup> Of course these websites are also of interest and probably also consulted by family members of people with ASD. However, given that we were able to easily recruit ASD participants via these websites indicates that people with ASD also frequently use these sites.

fewer distracting signals. Also, CMC often provides spatial and temporal distance between communication partners, and allows working at one's own convenience and pace, which fits the needs of people with ASD well. Several studies indicate that there is a special attraction to the Internet and computer-based tools for people with ASD (e.g., [Cheng, Kimberly, & Orlich, 2002](#); [Finkenauer, Pollmann, Begeer, & Kerkhof, 2012](#); [Grynszpan, Martin, & Nadel, 2008](#); [Ramdoss et al., 2011](#)). The conclusion of these studies is that the text-based nature of CMC affords a reduced-cues method of communication, greatly reducing the sensory overload that many ASDs experience, and thereby leading to improved communication. Not surprisingly, 80% of adults with ASD report to use social media and they spend on average three hours a day using them ([Mazurek, 2013](#)). Additionally, a survey among 138 people with ASD showed that text-based, asynchronous communication channels were preferred to traditional forms of communication and that people with ASD report a high level of internet use in general ([Benford, 2008](#)). We therefore know that people with ASD use CMC, but we do not yet know whether they use it more than people without ASD. Thus, our first goal is to compare CMC use of people with ASD with a control group.

### 1.2. Characteristics of CMC

Our second goal is to investigate whether people with ASD value different aspects of CMC than controls. Benford ([Benford, 2008](#); [Benford & Standen, 2009](#)) interviewed people with ASD and found that online communication provides them with a sense of liberation, afforded by specific characteristics of CMC. The first of these characteristics is control, both over the timing (communicating at a self-selected time) and pacing (immediacy of response) of a conversation, and over the way one can present oneself. Another main point was the clarity of written text; more structured, and with less social chit-chat than in real life. The absence of non-verbal cues was important for diminishing the stress brought about by real-life conversations. [Burke, Kraut, and Williams \(2010\)](#) found similar themes, describing the attractiveness of features such as CMC's slower pace and the absence of non-verbal signals and of the need for making eye contact. Furthermore, the possibilities to find like-minded people and to use predefined emoticons were named as benefits. A study by [Davidson \(2008\)](#) suggests that the emergence of an autistic culture online is supported greatly by special features of CMC such as its slower pace, the ability to communicate with like-minded people, and the absence of the demands of physical co-presence. In a case study on virtual world use, [Stendal and Balandin \(2015\)](#) found that their subject liked the virtual world because they feel more comfortable communicating. Recently, [Gillespie-Lynch, Kapp, Shane-Simpson, Smith, and Hutman \(2014\)](#) were the first to compare the preferred use of different internet functions and the perceived benefits of CMC use of adults with and without ASD. They found that adults with ASD value different aspects of the Internet than controls. For example, they value it more than controls that they can meet people with the same interests, but value it less than controls that they can easily stay close to friends and family. Additionally they found that adults with ASD appreciate several aspects of CMC more than controls, like the fact that they have more time to think and can more easily express their true self. Their study provides a first indication to the qualitative differences of Internet and CMC use of people with and without CMC. Our study provides an extension of their findings. Other than [Gillespie-Lynch et al. \(2014\)](#) we will not only ask people to what extent they value certain given categories but also include an open question, so that people can indicate themselves which features of CMC they value most. This approach enhances the validity of the research because it may be that people with ASD value aspect of CMC that people without ASD (including most researchers) do not think of.

### 1.3. CMC use and well-being

The third goal is to study how CMC use is related to well-being. Although some early studies on the link between CMC and well-being in the general population suggested that CMC can have a negative impact on people's social life ([Kraut et al., 1998](#); [Nie & Erbring, 2000](#)), more recent studies link CMC use to various positive social outcomes ([Amichai-Hamburger & Furnham, 2007](#)). For example, [Valkenburg & Peter \(2007\)](#) find a positive relationship between instant messaging, and time spent with existing friends and the quality of those friendships. Additionally, researchers have noted how the Internet offers an additional set of tools for getting acquainted with people, and maintaining these contacts ([Ellison, Steinfield, & Lampe, 2007](#); [Orr et al., 2009](#); [Steinfeld, Ellison, & Lampe, 2008](#)). Whether these advantages hold in the same way for people with ASD is not yet fully clear. There are only a few studies relating CMC use of people with ASD to life outcome variables, most of them without a control group. For example, [Davidson \(2008\)](#) and [Mitchell \(2003\)](#) studied autistic culture online and found that the ability to have meaningful communication without the need to respond immediately, and the slower pacing of CMC in general, could alleviate the stress that many ASDs encounter during real-life encounters. [Benford and Standen \(2009\)](#) surveyed people with Asperger's syndrome and high-functioning autism about their experiences and perceptions of CMC. Their subjects report that CMC has helped them expand their social networks and get more social support, decreasing feelings of loneliness. However, a recent study on social media use in adults with ASD found no link between frequency of use and feelings of loneliness ([Mazurek, 2013](#)).

The only study in this area with a control group is a study of word usage in blogs by [Newton, Kramer, and McIntosh \(2009\)](#). Interestingly, word usage was found to be almost identical in the two groups, except for the use of social words, which was more variable in ASDs than in controls. Their conclusion was that online there might be little differences in communication between the two groups, and that social-communicative deficits of ASDs could be induced by the proximal setting in which traditional social contact takes place, rather than being an impairment per se. Newton and colleagues suggest that in a more distal setting, as provided by CMC, the manifestation of these deficits may be diminished or even absent. This view is in

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